

the river there is a field with a dense crop of couch grass, and in this too was *C. albomarginatus*, rather to my surprise, as I have not before come across it in long thick grass. With it was *Conocephalus dorsalis* in fair numbers on the couch. I was rather surprised to find *C. dorsalis* on couch grass, as I have always considered it dependant upon rushes. It requires rushes, as it needs a stem with pith in which to oviposit, which grass does not provide. There was a sluggish brook running through the field with muddy banks. Here were sea aster, sea blite and rushes, but on these, which grow only in the mud near the water's edge, I saw no *C. dorsalis*. Perhaps there were some on the rushes, but I did not see them. No sign of *Acrydium*, nor was *Ch. parallelus* there. I wonder if *Ch. parallelus* and *Ch. albomarginatus* are mutually exclusive. There was no reason visible to my eye why the former should not have mixed with its congener on the football ground.

A few days later I swept in the nettle beds in the avenue of ilex at Goring Point. Here there were plenty of the Common Earwig, and one or two *Leptophyes punctatissima* and, in the fields around, *Ch. parallelus*, but not *Ch. albomarginatus*. There is one small bed of rough grass, with nettles, burdock, bitter sweet, couch grass and knotgrass, covering only a few square yards, between the footpath and the beach, just above highwater mark. Sweeping in here was difficult, owing to the old bricks, logs, chunks of concrete and pieces of wire, but it was worth the effort as I found a colony of *Forficula lesnei*. It was curiously restricted, for the moment I left that little patch I found only *F. auricularia*. By comparison, *F. lesnei* is an anaemic, undersized creature, and I should think it is being pushed out of existence by the stronger species. I noticed, rather to my surprise, that the numerous still immature specimens were narrower and darker than those of the common earwig. It would, I should think, have been a record to have caught a rabbit in a sweep-net, and I do not know which was the more startled, the bunny or I. But for the central stick, he would have been in the net.

GADFLIES IN THE SAVOY ALPS, 1938.

Plate IV.

By P. A. H. MUSCHAMP.

The year 1938 has been a superlatively good one from the point of view of the student of *Tabanidae*, and a superlatively bad one from the point of view of the cow, the horse, and the mere tourist. To meet with several members of the genus *Sziladynus* so early as May and so late as 15th September is almost incredible. Cattle tenders declare that all gadflies are completely destroyed by the first storm after 10th August and, till this year, I have found this to be true. Alpine flora was late and Alpine insects were early. I think this may be explained by the phenomenally early spring followed by a cold spell which destroyed the early buds and retarded the plants, but did not damage the larval life of insects that had been forced on as in a hot-house. Curiously enough, although the ♀ gadfly was so very abundant, ♂♂ were harder to capture than last year, and I found none on the flowers that they generally haunt. I am not going to transcribe my notes on

all the *Tabanidae* taken this year. I shall confine myself to notes on variations in the sub-family *Tabaninae* and a description of several new forms. To assist me in comparing my Alpine flies with others, I have consulted the very clear descriptions of E. Rivenhall Goffe so far as the British list goes. Surcouf has given us a useful monograph, but many changes have taken place since 1924. To get nearer to the source I have made considerable use of Schiner (1862), Meigen (1804), Meigen and others (1820, etc.). I consulted also, but with small profit, my Linnaeus (1758 and 1761) and terminated by a prayer to the gods to send us a worthy successor of Verrall, who is a well of information, but, like other wells, does not cover much ground. Séguy's work on Diptera is up to date, but his *Tabanidae* section does not pretend to be more than a table. I follow Séguy's order and nomenclature, i.e., Enderlein's genera, even when I quite disagree with them.

The chalet where I spend the summer months is about an hour from Arâche, about 4500 feet above sea level. Hard by runs a torrent, a favourite haunt of *Hilara*. Mountains all around me, among others the wonderful Platté and its desert. The district is not very rich in Lepidoptera, though certain slopes haunted by *P. delius* often provide beautiful dark forms that are really well worth while. Almost all other orders are well represented, especially the sawflies.

Following Séguy, *Dasyrhamphis atra*, Rossi comes first and is a fly which rarely shows itself in my happy hunting ground. Those which I captured this year only vary in the coloration of the eye, which, instead of being blackish green, is sometimes brown and in one case blue.

The next genus, *Glaucops*, has not yet been taken in the Savoy. Its one species has only been taken at St Moritz, Switzerland, it would seem; however, I captured a fly, *Sz. harriettae* (see below), which should possibly be placed here, antenna III being ovate.

Straba is a genus which contains all the British Tabanini except *T. bovinus*, Loew. It is characterised by the upper corneules or facets of the ♂ eye being separated sharply from the lower and much smaller corneules.

Straba sudetica, Zeller is, as in England, rather more frequently met with than *Tabanus bovinus*. In 1937 the ♂♂ were easily captured on the flowers of a tall Umbellifer together with ♂♂ of *T. apricus*. In 1938 these flowers seem to have lost their attraction. The Alps have given me no interesting form of *sudetica*, but in Leicester, where the fly appears to be very rare, I have taken two flies that are minus the central triangles on the abdomen. This is perhaps worth noting, as I find no mention of a tendency in this direction. The venter is dark and there is scarcely a trace of the pale margins on tergites or sternites.

S. glaucopsis, Meigen did not arrive till the last days of July and was still fairly plentiful on 15th September. It varies considerably and I regret that I did not bring home a long series. The following forms are worth mentioning:—

- (a) 17 ♂♂ with 2 recurrent veinlets; abdominal flecks normal
- (b) 13 " " 1 " " " " "
- (c) 3 " " 2 " " " " " " " " " "
- (d) 6 " " 2 " " " " " " " " " "
- (e) 8 " without " " " " " " " " " "

- (f) 15 flies with coal black abdomen and red spots on segments II and III, sometimes a third on IV. Central triangles reduced to a few tawny red hairs on segment II only. Antennae all red. Palpi reddish. Venter uniformly covered with gold pubescence. A fine fly, rather larger than *glaucoptis*=ab. **rubra** new ab.
- (g) One of the *rubra* has, in addition to the recurrent veinlets, an extra median vein, i.e., 4 veins spring from the discoidal.
- (h) One fly with uniform brown eyes.

There is also considerable variation in the frontal calli. (d) is the var. *cognata*, Loew; (a), (b), (c) and (e) are unnamed; the side spots of *rubra* are isolated as in *cognata*, but smaller. *Cognata* flies everywhere with *glaucoptis* but is less common. I was greatly surprised to find a *Phalangus* running off with a lady *glaucoptis* held under it and still alive. The gadfly was quite as large as the Daddy-long-legs, which, nevertheless, was moving rapidly when I bottled the two together, most unkindly.

Straba bromius, L. is a notoriously variable fly and I think I may say that all the named forms are found in these Alps. The British gadfly authority, Goffe, mentions a *bromius* captured in Somersetshire with a recurrent veinlet on one wing and another from Devonshire with a recurrent veinlet on both wings. At my alpine home this year I took 47 with recurrent veinlets and this means about 5% of those I examined. Whenever the vein R4 meets the vein R5, forming a right angle (see illustration), we may safely expect a recurrent vein or at least a little blob of black vein. The phenomenon may be thaumatological, but to me it seems more likely that it is a case of alpine atavism. This veinlet is regularly found in the genus *Dasystipia* and is mentioned by authors as the chief characteristic of the genus. Frequently the base of R4 looks like a cross vein between R5 and a foreshortened R4. When a genus is characterised by a phenomenon that occurs occasionally in other genera, it seems to me that some unnecessary splitting has taken place. I think it was a mistake not to have adopted Szilady's sub-genus *Ochrops*, which included *Dasystipia* and other yellow-eyed flies.

The eyes of the high-flying *bromius* are occasionally covered with fine short hairs. The var. *nigricans*, Szilady is not rare in my neighbourhood and is often of a more extreme form and more worthy of the name than the described form from Hungary.

Bromius is described by all authors as possessing a single and regular purple band on the eye, and this is what we always look for first when we examine a fly that looks like *bromius*. Last year I captured near my chalet 33 male *bromius* and of these 22 had no sign of an eye band. Females of this aberration seem to be rare, for in several years I have only captured two entirely without a band and three with a slight trace of one. These flies with uniform eyes bear a very close resemblance to the ♀ fly described as *S. regularis* (I can find no description of the ♂). I don't want to suggest that this African fly is a var. of *bromius*, but I wish to call attention to the fact that the straight purple bar on the eye is not a safe characteristic of the alpine *bromius* ♂. As 66% of the males, together with a few of the females that I examined, were of this form, I think I am justified in giving it a name, ab. **simplex**, new ab.

To continue: 4 *bromius* have green eyes. As many as 23 have raised apical calli on the frontal stripe, either single or double. Possibly an atavic form. One female, on the other hand, has no sign of a middle callus. Another has a small detached callus instead of the attached linear one. One has femora II yellow.

S. exclusa, Pandellé. Two or three that I have taken differ slightly from those described originally by Pandellé and those taken recently by Pierre.

The next genus, *Tabanus*, includes those of the hairless eyed Tabanini, whose males have eyes in which the corneules present no sharp contrast in size, but become progressively smaller. First in the list comes *T. apricus*, Meigen, a handsome fly which in July and August is all too common. This year it made its appearance exceptionally early—on the 10th of July. Its wonderful golden-green eyes flash so brightly that one can recognise them as far as they are visible. The males are bolder and tamer than those of any other European gadfly and only once, in Canada, have I come across a male Tabanid so easy to capture. It shows little variation. A few have less brilliant eyes:—I have taken (out of thousands) 4 ♀♀ with bright blue eyes, 1 ♂ and 1 ♀ reddish brown; 3 ♂♂ greenish red; 1 ♂ blue green; 1 ♂ dull brown. The abdominal triangles, always wanting in the males, are absent in about 10% of the females. The black abdominal central band of the male varies in breadth and is sometimes reduced to a couple of flecks. In size, I have a small ♂ 13 mm. and an outsize ♀ 20 mm. Although the difference between the eye facets is gradual it is marked by a very distinct line. A few of these northern (alpine) flies conform with the description of *T. graecus*, Fabricius. *T. bovinus* ♀♀ are just as easy as the ♂♂ to distinguish from *S. sudetica*, if you examine them ventrally. It is useless to take the form of the abdominal triangles into consideration as they vary almost as much in *bovinus* as in *sudetica*. *Bovinus* attacks horses in preference to cows. I do not think that either of them ever have much chance of tasting human blood as they are slow and settle down so heavily that they are immediately noticed. French authors give nearly the same figures for the dimensions of the two sexes. I know not what they are elsewhere but in the Alps there is a difference of from 2 to 4 mm.

The genus *Sziladynus*, Enderlein, is characterised by hairy eyes together with an ocelligerous callus on the vertex of the frontal stripe. This genus is well represented in my locality. The females of *Sz. aterrimus*, Meigen, *Sz. auripilus*, Mg. and *Sz. lugubris*, Zetterstedt, are all common, though it is quite impossible to say where one begins and the other ends. I have never seen and am inclined to disbelieve in the existence of a ♂ *auripilus* at any altitude, high or low. In my Alps the male is always the blackest of black *lugubris* and this I have taken in conjungo with *auripilus* and *aterrimus* (so far as I can distinguish these females). I am convinced that the thick yellow pubescence is restricted to the female. The hypothetical distinction of the frontal stripe is . . . hypothetical. One occasionally finds flies with the yellow pubescence replaced by grey or white. Occasionally also they show the recurrent veinlets, but infrequently (I took 8 this year).

Sz. harriettae, Muschamp. Here I must place what is either a new species or a very strange aberration. I cannot attach it to any

other fly, unless it be *Sz. micans*, Meigen. Thorax, abdomen, face, frontal stripe and antennae are all black. The eyes have no coloured bands. They are covered with whitish hairs of medium length. The frontal stripe is $4\frac{1}{2}$ times as long as broad at base and widens slightly at the vertex; the stripe is dusted over with white, which is easily lost; the basal and median calli are joined; the ocelligerous callus is rather small. Palpi yellowish brown with a brown stripe beneath, rather thinly covered with black hair. The third antennal joint is ovate and resembles that of *Glaucoptus hirsutus*, Villers (= *Therioptectes haematopoides*, Jaenicke). It is rather smaller than *aterrimus* or *micans*—13 mm. Its legs are not black but a uniform dark brown. Around the mouth parts are tawny silky hairs and there is a forest of long brown hairs on the meta- and pteropleurae. My reason for placing this fly here, as a possible form of *aterrimus lugubris*, is because of its general resemblance. The "hump" of the antenna of *lugubris* is very small and pointed and it would not be very surprising to find a specimen in which the little point was lost, but when this trait is combined with brown legs, a unicoloured eye and a slight difference in the palpi I cannot confidently pass it by as an aberration of *lugubris* or *micans*.

Sz. micans, Meigen, is found everywhere. In the mountains a particularly black form with but little of the tufts of white hair on the abdomen and with black, rather than brown palpi is the form generally met with. About one in a thousand has yellow palpi and about the same proportion is without the ocelligerous callus. I have only taken one *Sz. rupium*, Brauer.

Sz. montanus, Meigen, and *Sz. fulvicornis*, Meigen. The great authority, Séguy, considers that these are two separate species and one can generally follow Séguy blindly, but . . . The structural difference given is that the hump of the antennae is much more pronounced in *fulvicornis*. Moreover, *montanus* has all black and *fulvicornis* more or less red antennae. In favour of Séguy's decision I may add that *fulvicornis* appears a full month earlier than *montanus* in my neighbourhood. Both were flying together in the second half of July and the first few days of August. Then *montanus* alone remained. This looks quite convincing but unfortunately there are many intermediate flies both in the form and colour of the antennae. They are at all events very closely allied, if one be not a var. of the other. The same thing may be said of *solstitialis*, Schiner, *distinguendus*, Verrall and *muhlfeldi*, Brauer. I took 8 *montanus* with recurrent veins.

Sz. montanus var. **alpicola** (new var.) differs from *montanus* in appearance more than either the Danish *muhlfeldi* or the Manchurian *morgani*. It lives on a solitary plateau of about 5800 feet altitude, where there are no quadrupeds other than marmots or mayhap a chamois. I have taken only 25 females and no males, but live in hope of increasing my series. It is much smaller than *montanus*, 12 to 14mm., with a single giant of 16mm. (the said giant being much nearer *montanus* in colour as well as size). Eyes covered with short white hairs and having 3 purple bands, persistent after death. Frontal band $4\frac{1}{2}$ -5 times as long as broad at base and nearly parallel, dark grey (one is black), covered with black hairs; callus I (basal) rectangular, II spindle shaped and united both to I and III, III is indistinctly triangular with the "ocelli" transparency at apex. Antennae black,

stained throughout with red (as though the depth of the red showed black; 3 out of the 25 are quite black. Palpi yellow, 2nd article a long ovoid with blunt extremity. Thorax blackish, with 5 grey stripes; ante-alar callus reddish. Abdomen resembles the *bromius* group rather than the *montanus*; lateral patches on segments II and III are greyish-yellow and the row of tubercles is present on these flecks (I have examined about a thousand *montanus* and not one had these tubercles). Venter uniform dark grey (the intermediate larger fly has fulvous-red patches on I and II). Legs as in *montanus*. None have recurrent veinlet.

Sz. tropicus, Panzer, I have found only in the var. *bisignatus*, Jaennicke.

The genus *Atylotus* differs from *Sziladynus* in that the ocelligerous callus is absent; being replaced by a single or double callosity, which indeed may sometimes be wanting.

A. quatuornotatus, Meigen. I brought home a very short series of these flies, though I believe they were fairly plentiful.

A. quatuornotatus, var. **cherbottae** (new var.). Here is the probable cause of my neglect of the last mentioned. Not before I reached home did I notice what an interesting little group of 18 flies had been captured. A verbal description is not nearly so convincing as a drawing, so, fearing that I myself might exaggerate, I persuaded Miss Nichols of Leicester Museum to draw the frontal stripe of this fly to scale. The top callus is raised, shining black; studded with tubercles and rudimentary bristles, the sectional (?) lines on the two lower calli are slightly exaggerated. The hairs on the eyes are very long and thick. Other points of difference are very slight. There is no silver indumentum at the base of antennae, and the antennae are blacker than those of my *4-notatus*. The tarsi are black (not brown) above and red underneath.

Atylotus lowei or (*Sziladynus rupium*, var. *lowei*), Muschamp (Dr E. E. Lowe of Leicester Museum). According to the dichotomical tables of Surcouf, this fly should belong to the *Atylotus erberi* group, but these all have red abdomens. My private opinion is that it is a form of *Sz. rupium*, Brauer, minus the ocelligerous callosity that characterises the genus. The drawing shows you the extreme form, having no trace of the upper callus, a very fine pubescence marking the double *Atylotus* normal callus. In some specimens there is a low bifid callus. A short description of these flies will show you that, save for the upper callus and the entire absence of any ocellar transparency, they might pass for the Swiss *rupium*, especially as Surcouf says that the upper callus of the latter is on the way to regression. Eyes hairy, either with no purple band or with a short, weakly marked one. Legs bicoloured; femora black; tibiae I $\frac{1}{2}$ brown, II and III brown, tarsi black and red. Thorax and abdomen as in *rupium*. Antennae black, hump near base and rather accentuated. Palpi plump at base, elbowed, white with brown hair. Face black, with white pubescence around mouth parts and black hairs on eye margins. Occiput black with white indumentum. Frontal stripe and calli as illustrated. Against my *rupium* hypothesis comes the fact that *rupium* has not been taken in France and that careful examination with the microscope has not revealed a trace of an ocelligerous callus in any of my *lowei*. It would be revolutionary to place the variety in a separate genus from the

species, especially as I have only 10 specimens (all taken this year). Until a long series give confirmation in one direction or the other *lowii* stays with the *Atylotus*. The more one studies gadflies the more clearly one sees that they are in a state of evolution (and regression!). I am sorry that the old genus *Tabanus* should have been split up before the early stages of the larvae have been worked through. There will, I think, be much to correct.

Theriopectes albipes, Fab. (*Atylotus gigas*) is rare in the Alps.

Dasystipia fulva, Meigen, though common in the Arve valley, near our railway station, Cluses, rarely ever ventures up the mountain slopes. It takes nearly 3 hours to get down into the valley and a great deal longer to return, so *fulva* has been neglected. This brings me to the end of the list of the *Tabaninae* that I have captured in 1938. I am always surprised that no mention is ever made by authors of the black tubercles found on the abdomens of such a large percentage of gadflies. The microscope has taught me to believe that they are of chaetotaxical value.

Last August I took near my chalet a *Coenomyia feruginea*, Scopoli, a new fly for me. Last year, 1937, I took more than my share of interesting flies, including *Hexodonta dubia*, Zetterstedt, of which, so Séguy informed me, only one other has been taken in France. Perhaps I was too busy in other ways this year to do full justice to the flies. To terminate, let me express a hope that some more skilful entomologist may be tempted to come and join me next summer. There is much interesting work to be done, especially with the *Empididae*.

COLLECTING NOTES, 1938.

I: JANUARY—MID-JUNE.

By A. J. L. BOWES.

The following notes are a record of collecting done during 1938 in the intervals of schoolmastering. It is hoped that they may be of interest to those whose holidays fall at similar times of the year, and at the end I shall make some remarks about the methods of breeding employed for various species which I have had through my hands.

I did little collecting in the first three months of the year, but of the early species, *Theria* (*Hybernia*) *rupicapraria* was first noted in Surrey on 25th January, *Theria* (*H.*) *marginaria* on 31st January, *Alsophila* (*Anisopteryx*) *aesularia* on 6th February, *Phigalia pedaria* on 11th February, and *Erannis* (*H.*) *leucophaearia* on 19th February. During February and March I cut a good many willow twigs near Ripley, which I hoped contained larvae of *Synanthedon* (*Sesia*) *flaviventris*, but though I am convinced that I had several larvae, no moths emerged.

My first real excursion was on 27th March, when I went with Mr J. O. T. Howard to be introduced to *Bapta distinctata* (*Aleucis pictaria*), not far from East Horsley. We arrived on the ground at 7.30, and soon found the insect sitting about on the low bushes of sloe. All were beautifully fresh, and few were found on the larger bushes. Males and females seemed to be equally well out, and we continued to find them